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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,314	02/13/2002	Kenji Hoshi	020171	4466
38834 7590 10/28/2008 WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP 1250 CONNECTICUT AVENUE, NW SUITE 700 WASHINGTON, DC 20036				
EXAMINER				
MOVVA, AMAR				
ART UNIT		PAPER NUMBER		
2894				
MAIL DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/073,314

Applicant(s)

HOSHI ET AL.

Examiner

AMAR MOVVA

Art Unit

2894

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 13, 15 and 17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 12, 15 and 17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/S508)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 13 is rejected under 35 U.S.C. 102(a) or (e) as being anticipated by Ghinovker '833. Ghinovker discloses a semiconductor device comprising a plurality of alignment marks (76, fig. 2-5b) formed over a semiconductor wafer (lines 40-50, col. 4), each of the alignment marks being divided by a micronized line-and-space pattern into a plurality of lines extending along a first direction (76, fig. 2-5b), each of the plural lines being divided into a broken line having a plurality of segments which are arranged in the first direction only (78 of 76, fig. 2-5b), and wherein all of the alignment marks formed in the entire alignment mark area have the same shape so as to generate about the same field image alignment signal (fig. 2-5b). Positions of the divisions between the plurality of segments of the lines are offset from those of the divisions between the plurality of segments of their adjacent lines (fig. 2-5b). A margin in which the micronized pattern is formed is larger than a margin for a device pattern to be formed on the semiconductor wafer (lines 60-68, col. 4).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-4 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ghinovker '833 in view of Ning '707.

a. Ghinovker discloses a semiconductor device comprising a plurality of alignment marks (76, fig. 2-5b) formed over a semiconductor wafer (lines 40-50, col. 4), each of the alignment marks comprising a micronized pattern (78 of 76, fig. 2-5b), the micronized pattern having a size smaller than a resolution limit of an alignment sensor of field image alignment detecting positions of the alignment marks (fig. 2-5b), the micronized pattern having a pattern forming margin larger than a pattern forming margin which an integrated circuit pattern formed over the semiconductor wafer has (lines 60-68, col. 4), and wherein all of the alignment marks formed in the entire alignment mark area have the same shape so as to generate about the same field image alignment signal (fig. 2-5b). The micronized pattern is a line-and-space pattern (fig. 2-5b). Each of lines constituting the line-and-space pattern are divided into a broken line having a plurality of segments (78 of 76, fig. 2-5b). Positions of the divisions between the plurality of segments of the lines are offset from those of the divisions between the plurality of

segments of their adjacent lines (fig. 2-5b). The alignment marks are constituted in a single layer (fig. 2-5b). However, Ghinovker does not expressly disclose that the integrated circuit pattern is a memory cell pattern.

b. Ning discloses a semiconductor device wherein the integrated circuit pattern is a memory cell pattern [0003].

c. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used a memory cell pattern in Ghinovker's integrated circuit pattern in order to provide the benefits of Ghinovker's invention to a larger group of applications (e.g. to memory devices).

2. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ghinovker '833 in view of Ning '707.

d. Ghinovker discloses the device of claim 13 but does not expressly disclose that the integrated circuit pattern is a memory cell pattern.

e. Ning discloses a semiconductor device wherein the integrated circuit pattern is a memory cell pattern [0003].

f. It would have been obvious to one of ordinary skill in the art at the time of the invention to have used a memory cell pattern in Ghinovker's integrated circuit pattern in order to provide the benefits of Ghinovker's invention to a larger group of applications (e.g. to memory devices).

PLEASE NOTE: The Examiner notes that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention

and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. See, e.g., *In re Pearson*, 18 1 USPQ 641 (CCPA); *In re Minks*, 169 USPQ 120 (Bd Appeals); *In re Casey*, 152 USPQ 235 (CCPA 1967); *In re Otto*, 136 USPQ 458, 459 (CCPA 1963); See MPEP §2114. The recitation of "the micronized pattern having a size smaller than a resolution limit of an alignment sensor of field image alignment detecting positions of the alignment marks", does not distinguish the present invention over Ghinovker '833 who teaches the structure as claimed.

Response to Arguments

Applicant's arguments filed 1-17-08 have been fully considered but they are not persuasive.

- a. Applicant argues that Ghinovker's sub-structures are about the same size and pitch as the actual integrated circuits. Further applicant argues that the micronized pattern's pattern forming margin is still the same as the pattern forming margin of the finely segmented elements 78, even if the micronized pattern comprises the plurality of the finely segmented elements 78. This, however, appears to be incorrect. Examiner does not understand as to what basis applicant concludes that the micronized pattern has the same pattern forming margin as the integrated circuit. To the contrary the pattern forming

margin would include the plurality of substructures. For example applicant's specification states "Grooves 85 forming the L/S pattern of the alignment marks are formed in the inter-layer insulation film 80 of the mark region 64. The grooves 85 are filled with the titanium nitride film 83 and the tungsten film 84 formed at the time of forming the plugs 82 of the DRAM. A pattern forming margin of the grooves 85 is larger than a cell pattern of the memories to be formed in the memory cell region 62". The pattern forming margin corresponds to width/workspace of the grooves (85, fig. 2) which is larger than a memory cell pattern. Applying this concept to the micronized pattern to Ghinovker, the pattern margin would correspond to the width/workspace of the micronized pattern not individual substructures of the micronized pattern.

b. As an aside although not relevant to patentability applicant argues that Ghinovker is directed to overlay marks while applicant's invention is directed towards alignment marks. Examiner notes, however, that whether a line and space pattern is an alignment mark or an overlay mark is merely an expression of **intended use**. Moreover overlay marks could be used as alignment marks if visible to a sensor as both are merely line and space patterns.

c. Applicant argues that in interpreting claim 13 consideration should be given between the direction in which the segments the broken line are arranged and the extending direction of the plurality of the lines which the alignment mark is divided into. Examiner notes, however, there is nothing in claim 13 that

requires the **offsets** of the divisions of the plurality segments are related direction wise the broken line of the plural lines.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AMAR MOVVA whose telephone number is (571)272-9009. The examiner can normally be reached on 7:30 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Nguyen can be reached on 571-272-2402. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kimberly D Nguyen/
Supervisory Patent Examiner, Art Unit 2894

Amar Movva
Examiner
Art Unit 2894

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